Comparison of I2RS YANG Pub Sub Requirements to YANG PUSH Draft

NETCONF WG - IETF 93

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draft-clemm-netconf-yang-push-01 overview/refresher

- Provide push mechanism as alternative to polling, centered around datastore subscription service

- Subscription model

  Subscription services: <create-subscription>, <delete-subscription>, <modify-subscription>

  Parameters to specify subscribed data, periodic or on-change, period, filters

  Subscription negotiation:

  Server not obliged to accept requests, can suggest alternative parameter settings

  Subscription management: status of subscriptions, notifications, etc

- Push mechanism / transport

  Netconf binding: notifications to carry datastore updates

- Leverage RFC 5277

  Some parameter extensions proposed

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draft-clemm-netconf-yang-push-01 updates from "-00"

- A new parameter option that allows to specify which encoding to use for datastore updates

- A new parameter option that allows to limit on-change subscriptions to certain types of changes

- Mechanisms to maintain authentication granularity after subscription establishment

- Various editorial updates

What is being compared here?

Requirements for Subscription to YANG Datastores
draft-ietf-i2rs-pub-sub-requirements-02

Purpose: Intended to capture requirements across
            multiple WG, including futures.

WG State: WG Consensus

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following slides
detail which rqts
are supported,
and which are not

Subscribing to datastore push updates
draft-clemm-netconf-yang-push-01

Purpose: Cover key rqts, with minimal complexity.
            Don't try to embody all possible futures.

WG State: Individual Draft

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Legend

Supported by
Technology Draft?

Yes	Technology draft supports requirement
not defined	Technology draft does not specify how to support the requirement. (Enhancements to the draft possible if WG feels closure is desired)
implementation decision	How to support the requirement is internal to the code, and not exposed in the technology draft
via Netconf	The requirement is supported via NETCONF without additional needs in the Technology draft
not possible with Netconf …	The requirement is not supportable over NETCONF (… over foo)

General Requirements

Supported by Technology Draft?	from the Requirements Draft
Yes	… must support the ability to create, renew, timeout, and terminate a Subscription.
Yes	… must be able to support and independently track one or more Subscription Requests ...
Yes	… must be able to support an add/change/delete of one or more YANG subtrees …
Yes	… must support Subscriptions against operational datastores, configuration datastores, or both.
Yes	… must be able support a Subtree Filter ...
Yes	… must publish only data nodes meeting accepted filters...
Yes	… must support periodic subscriptions. The subscription period must be configurable...
Yes	… should support on-change subscriptions …
Yes	… must support a configurable dampening period (if on-change is supported)
Yes	… must allow Subscriptions to be monitored...
Yes	… should be able to interpret Subscription QoS parameters, and only establish a Subscription if …
Yes	… must support terminating of a Subscription when requested by the Subscriber.
not defined	… should support the ability to suspend and to resume a Subscription on request of a client.
Yes	… may at its discretion revoke or suspend an existing subscription.
Yes	… may offer the ability to modify a subscription filter....

Negotiation Requirements

Supported by Technology Draft?	from the Requirements Draft
	A Subscription Service must be able to negotiate the following terms of a Subscription:
Yes	• The policy: i.e. whether updates are on-change of periodic
Yes	• The interval, for periodic publication policy
Yes	• The dampening period, for on-change update policy
Yes	• Any filters associated with a subtree subscription
Yes	A Subscription Service should be able to negotiate QoS criteria for a Subscription.
Yes	where a Subscription Request cannot be fulfilled, must include in its decline a set of criteria that would have been acceptable …

Update Distribution Requirements

Supported by Technology Draft?	from the Requirements Draft
Yes	For on-change updates, the Subscription Service must only send deltas ...
Yes	When not able to send updates per its subscription contract, must notify subscribers ...
not defined	When a Subscription with on-change updates is suspended and then resumed, the first update should include updates of any changes that occurred while the Subscription was suspended, with the current value...
Implementation decision	Multiple objects being pushed to a Subscriber, …should be bundled together into a single Update.
Implementation decision	… Update must not be delayed beyond the Push Latency ...
Implementation decision	… Update must not be delayed beyond the dampening period ...
Implementation decision	… Update must not occur before the dampening period expires...
not defined	… may, as an option, support a persistence/replay capability.

Transport Requirements

Supported by Technology Draft?	from the Requirements Draft
not defined	A Subscription Service should support different transports.
Yes	A Subscription Service should support different encodings of payload.
Yes	It must be possible for Receivers to associate the update with a specific Subscription.
Yes	… when a transport connection drops, the associated Subscription should be terminated...

Security Requirements

Supported by Technology Draft?	from the Requirements Draft
via Netconf/SSH	... mutual authentication between the Subscriber and the Subscription Service.
via Netconf/SSH	... provide cryptographic authentication in so that Subscriber can't pose as Subscription Service
Yes	Versioning must be supported.
Yes	Data pushed must be authorized in the same way as regular data retrieval …
Yes	Additions or changes within a subtree … must be validated against authorization methods ...
not defined (except for root)	A loss of authenticated access to subtree or node should be communicated to the Subscriber
Yes	Subscription requests … must be properly authorized.
not possible with Netconf	When the Subscriber and Receiver are different, the Receiver must be able to terminate Subscription ...
Implementation decision	A Subscription Service should decline a Subscription Request if it would deplete its resources...

Subscription QoS Requirements

Supported by Technology Draft?	from the Requirements Draft
Yes for Dampening & Deadline	negotiate the following Subscription QoS parameters : Dampening, Reliability, Deadline, Bundling.
Yes	must be able to respond to requests to verify the Liveliness of a subscription.
Yes	must be able to report the currently monitored Nodes of a Subscription.
Yes	must be able to negotiate the minimum time separation since the previous update …
Not possible over Netconf	may send Updates over Best Effort and Reliable transports.
Via Netconf	must be sent to the Receiver in sequential order.
Not defined	should have the ability to bundle a set of discrete object notifications into a single update …
Not defined	For any bundled updates, must provide information to reconstruct the order and timing of updates.
Yes	must be able to push updates at a regular cadence aligning with start and end timestamps…
Yes	should be able to delay Updates on object push for a configurable period
Implementation decision	must be possible for an administrative entity to determine the Push latency…

Filtering Requirements

Supported by Technology Draft?	from the Requirements Draft
Yes	If no filtering criteria are provided, or if filtering criteria are met, updates for a subscribed object must be pushed…
Yes	It must be possible for the Subscription Service to receive Filter(s) and apply them ...
Yes	It must be possible to attach one or more Subtree and/or Property Filters to a subscription.

Assurance and Monitoring Requirements

Supported by Technology Draft?	from the Requirements Draft
Yes	It must be possible to fetch the state of a single subscription from a Subscription Service.
Not defined	It must be possible to fetch the state of all subscriptions of a particular Subscriber.
Coming in '-02' version modifications	It must be possible to fetch a list and status of all Subscription Requests over a period of time.

Key Items worthy of discussion within WG

- Should we introduce additional built-in datastreams limited to operational data ?

- Should we support subscription persistency ?

- Should we provide guidance on "chunking" of updates ?

- Should the subscriber be able to suspend / resume a Subscription ?

- Should the loss of authenticated access to YANG subtree be communicated to the Subscriber ?

- Are there filters which should be provided beyond RFC 5277 Subtree and Property Filters ?